of the various plant associations agrees very closely in every instance with variations in this ratio, the vertical range of littoral species being strictly and sometimes very narrowly limited. Strangely enough, practically no species is found to be distributed, as so often reported, "between tide marks." The data upon the evaporative power of the air are scanty, only going to show that it is high, for as the atmometer readings were for a few hours of daylight only, no significant comparisons could be made with the data of other observers. Aeration due to tidal movements seems to be of some importance, while upon variation of salinity, the direct action of rain upon exposed vegetation, and the variation in light and their effects few exact data have been obtained as yet, but the careful study of the question of relative times of submergence and exposure has clearly defined many dependent problems for future investigation. This is perhaps the largest contribution from the careful and extended work of the authors.

Little less important than the careful analysis of the factors controlling the vegetation is the detailed study of the distribution both of the plant associations and of the species composing these associations. The results are expressed in several excellent vegetational maps of the entire harbor, of the sand spit, and of the estuarial marsh, together with belt transects on a large scale of the spit and the marsh. These provide a basis for future studies, two or more decades hence, that will certainly do much to give a better understanding of the causes and progress of plant succession in this and similar areas. The abundance of the data, the care with which they have been collected and arranged, the number of the maps, diagrams, and tables, and the organization of the discussion, are all matters to be highly commended. The deficiencies and omissions are such as are dependent upon the size of the problem and the multiplicity of the factors involved, rather than upon the neglect or oversight of the investigators, who are to be congratulated upon their patience and care in making so important a contribution to our knowledge of littoral vegetation.—GEO. D. FULLER.

Taxonomic notes.—BARTLETT[8] has described a new Mexican guayule, naming it *Parthenium Lloydii*, collected by LLOYD in Zacatecas.

DIXON[9] has described 10 new species of African mosses, one of which (*F. Wageri*) is made the basis of a new section of *Fabronia*. He also notes and discusses 21 additional rare species.

EVANS[10] has described a new species of *Metzgeria* (*M. grandiflora*) from the Galapagos Islands, included in a collection of liverworts made by ALBAN

[8] BARTLETT, H. H., *Parthenium Lloydii*, a new Mexican guayule. Torreya **16**:45–46. 1916.

[9] DIXON, H. N., New and rare African mosses, from MITTEN's herbarium and other sources. Bull. Torr. Bot. Club **43**:63–81. *pl. 1.* 1916.

[10] EVANS, A. W., A new species of *Metzgeria* from the Galapagos Islands. Torreya **16**:67–70. *figs. 5.* 1916.

STEWART while acting as botanist to an expedition of the California Academy of Sciences. It is said to be the first representative of the Metzgeriaceae from this group of islands. The specific name refers to the unusually large female branches.

GOLDMAN[11] has described 3 new species of *Quercus* from Lower California, included in a collection made by himself and E. W. Nelson during a general exploration for the biological survey of the United States Department of Agriculture. The period covered by the expedition was from April 1905 to February 1906, during which the entire length of Lower California was traversed. In addition to the 3 new oaks, 19 other new species have already been published from material collected by this expedition.

GRIFFITHS[12] has described 10 new species of *Opuntia* from material collected mostly in the Mexican border region, and chiefly in Texas. It is a noteworthy fact that all of these species have been propagated vegetatively in the *Opuntia* collection growing at Chico, California, have been studied in the field, except in one instance, and the majority of them have been grown to maturity from the seed.

HALLIER,[13] in his study of the flora of Borneo, has described 9 new species.

NAKAI,[14] in this sixth contribution dealing with the woody plants of Korea, has presented the Pomaceae, describing 4 new species of *Pyrus*.

OKAMURA[15] has published a list of marine algae collected in the Caroline Islands in 1915. The list includes 28 species of Chlorophyceae, 11 species of Phaeophyceae (2 new species), and 22 species of Florideae (1 new species).

OSTERHOUT[16] has described a new species of *Phacelia* (*P. denticulata*) from Colorado. It is related to *P. glandulosa* and *P. neo-mexicana*.

PENNELL[17] has begun a series of notes on the plants of the southern states. The first paper consists chiefly of a critical revision of the genus *Commelina* in the United States. The full key to the species, serving the purpose of specific descriptions, is followed by a list of the 9 recognized species with full citation of exsiccatae.

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[11] GOLDMAN, E. A., Plant records of an expedition to Lower California. Contr. U.S. Nat. Herb. **16**:309–371. *pls. 104–133.* 1916.

[12] GRIFFITHS, DAVID, New species of *Opuntia*. Bull. Torr. Bot. Club **43**:83–92. *pls. 2, 3.* 1916.

[13] HALLIER, HANS, Beiträge zur Flora von Borneo. Beih. Bot. Centralbl. **34**:19–53. 1916.

[14] NAKAI, T., Praecursores ad floram sylvaticam Koreanam. VI (Pomaceae). Bot. Mag. Tokyo **30**:15–33. 1916.

[15] OKAMURA, K., List of marine algae collected in Caroline Islands, 1915. Bot. Mag. Tokyo **30**:1–14. *figs. 9.* 1916.

[16] OSTERHOUT, G. E., A new *Phacelia* from Colorado. Torreya **16**:70–71. 1916.

[17] PENNELL, F. W., Notes on plants of the southern United States. I. Bull. Torr. Bot. Club **43**:93–111. 1916.

PITTIER[18] has published his fifth contribution dealing with new or noteworthy plants from Colombia and Central America. Under various subtitles 15 new species are described, representing 12 genera, *Bombacopsis* (Bombacaceae) being a new genus. There is also a revision of *Brownea* and *Browneopsis* (Caesalpiniaceae), as represented in Panama, Colombia, and Venezuela.

TAKEDA[19] has described a new genus (*Dysmorphococcus*) of algae, which resembles externally *Trachelomonas*. The material was found in a small stagnant pond in Richmond Park, Surrey, England.

VAN ALDERWERELT VAN ROSENBURGH,[20] in his seventh paper on new or interesting Malayan ferns, has published as new species or with new names 42 species of ferns, representing 21 genera, and also 3 new club mosses.—J. M. C.

Temperature and growth rate.—LEITCH,[21] working in the plant physiology laboratory of the University of Copenhagen, has done an excellent piece of work upon the effect of temperature on the rate of growth of the main root of *Pisum sativum*. Short experimental periods were used to avoid errors due to changing rate in the course of the grand period of growth. The period of maximum growth rate (root 5–10 mm. long) was also chosen. It was important in determining methods of experimentation that diffuse light or change of temperature, as such, does not modify the rate of growth of this organ. The temperature coefficient, Q_{10}, is as follows for temperatures between 0° C. and 28° C.

Range of temperature	Temperature coefficient	Range of temperature	Temperature coefficient
0–10° C. . . .	8.25	12–22° C. . . .	2.67
2–12°	6.28	14–24°	2.44
4–14°	4.58	. . . . .	. . . .
6–16°	3.72	16–26°	2.31
8–18°	3.24	18–28°	2.22
10–20°	2.88		

The temperature coefficient is typically VAN'T HOFF'S only between 10° and 29° C., while below 10° C. the coefficient exceeds the VAN'T HOFF value of 2 to 3. This means little regarding the nature of the growth process, for the coefficient often greatly exceeds 3 in monomolecular reactions *in vitro*. In

[18] PITTIER, HENRY, New or noteworthy plants from Colombia and Central America. V. Contr. U.S. Nat. Herb. **18**:143–171. *pls. 57–80. figs. 10.* 1916.

[19] TAKEDA, H., *Dysmorphococcus variabilis*, gen. et sp. nov. Ann. Botany **30**:151–156. *figs. 15.* 1916.

[20] VAN ALDERWERELT VAN ROSENBURGH, C. R. W. K., New or interesting Malayan ferns. VII. Bull. Jard. Bot. Buitenzorg **20**:1–28. *pl. 4.* 1915.

[21] LEITCH, I., Some experiments on the influence of temperature on the rate of growth in *Pisum sativum*. Ann. Botany **30**:25–46. *figs. 10. pl. 1.* 1916.